COMP2402B (Fall 2025)
Abstract Data Types and Algorithms
Course Outline

We, the people of the Faculty of Science at Carleton University, acknowledge that our campus is located on the traditional, unceded territories of the Algonquin Anishinabeg people. We are grateful for this land, the air that we breathe, and the water that sustains us all as well as for the animals, plants, and other living beings: these enable us to research, teach, mentor, support, study, and learn. We recognize our responsibility to our natural environment and to reconciliation with Indigenous peoples.

Course Description:

This course builds upon the principles introduced in COMP 1405 and COMP 1406 and provides a general background for further study in Computer Science. The course will cover object-oriented programming concepts; the design and implementation of data structures (linked lists, stacks, queues, trees, heaps, hash tables, and graphs) and related algorithmic techniques (searching, sorting, recursion); and algorithm analysis. Students will be expected to complete a number of programming projects using the concepts presented.

Precludes additional credit for COMP 2002 (no longer offered), SYSC 2002 (no longer offered), and SYSC 2100.

Prerequisite(s): one of COMP 1406, COMP 1006, with a minimum grade of C-.

Postrequisite(s): A minimum grade of C- in COMP 2402 is required to take the postrequisite course. The course list can be found in the Carleton University Calendar.

Instructor: Farah Chanchary (she/her)

Email: farahchanchary@cunet.carleton.ca

Lectures: Online asynchronous

Course Website: All course materials and resources will be available on Brightspace.

Learning Modality:

- Pre-recorded lecture recordings will be posted on the Brightspace course webpage.
- A list of teaching assistants and their contact information and student hours will be posted once the course starts.
- In addition to office hours, questions pertaining to lectures, quizzes, and general course material can be asked/answered on Brightspace.
- The midterm and final exams will be in person on campus, scheduled by the University.

Topics Covered and Learning Outcomes:

Below is a summary of topics the course will cover:

- Interfaces and Implementation (The Java Collections Framework)
- Sequences: lists, stacks, queues, deques
- Array-based and Linked-list based implementations of sequences
- Unordered sets - hash tables

- Ordered sets - balanced search trees, skiplists
- Priority queues - heaps
- Sorting algorithms
- Graphs
- Applications of data structures
- Performance issues

A detailed breakdown of topics and a tentative calendar are available on the course website.

Learning Outcomes
By the end of this course, successful students will have demonstrated their ability to:

- Discuss basic types of data structures, their implementation, application, strengths, and weaknesses.
- Analyze the pros and cons of various solutions to a given problem and make educated decisions on which code is best for the given situation.
- Design better code (efficient, reliable, fast, and elegant), leading to software that runs faster and consumes less memory.

Assessment Scheme:
In this course, students will be evaluated according to the following criteria.

Criteria	Frequency	Total %
Weekly Quizzes	Best 9/11	15%
Midterm exam (in-person, on campus)	1	15%
Assignments	Best 4/5	40%
Final exam (in-person, on campus)	1	30%
Bonus	Remaining quiz and assignment scores	5%

Important dates and deadlines can be found here: https://calendar.carleton.ca/academicyear/#fall2025, including class suspension for the fall breaks and statutory holidays.

Software Requirements: We will use the Java programming language in this course. Download the latest JDK for your computer's operating system from Oracle's official website. Be sure to install the JDK and not just the JRE. You may use your favorite editor.

You will also need access to reliable internet and a laptop/desktop computer. Please review the requirements at https://carleton.ca/scs/scs-laptop-requirement/laptop-specs/.

Recommended Textbooks:
The textbook for the course is Pat Morin's "Open Data Structures". Free PDF and HTML versions of the book are available at opendatastructures.org. We will use the Java version.

Collaboration is NOT allowed on any assessment criteria. Assignments, quizzes, and exams must be completed individually. Discussing assignments and quiz problems is allowed on a high level, but students should write code without any assistance from others.

- The use of any AI system to generate assignment code will be considered academic misconduct. This includes, but is not limited to, chatbots (e.g., ChatGPT, Google Gemini, Microsoft Copilot), research assistants (e.g., Elicit), and image generators (e.g., Stable Diffusion, Dall-E), etc. An exception to the above rule is made for automated grammar and punctuation checking tools (such as Grammarly).
- Doing well in this course is not only about getting a high grade. It means you really understand the material, and you can connect it with what you have learned before and what you will learn in the future. It is normal to feel uncomfortable when learning something new. But if you can try to challenge yourself a little, instead of always looking for answers directly from AI, you will improve much more. Real understanding comes from your own thinking and effort.
- Students are not allowed to post questions/answers online (to sites like Chegg, CourseHero, etc.) and are never permitted to share or upload course materials without explicit permission from their instructor.
- There is a separate plagiarism policy document for this course in Brightspace. Students must read this document thoroughly and must agree to adhere to this policy (and to all policies stated in this course outline) before the assignment resources will be made available.
- If you are still unsure of the expectations regarding academic integrity (how to use and cite references, how much collaboration is appropriate), you are invited to discuss any concerns with the instructor at the earliest opportunity.

Late and Missed Work Policies: All assignments are due on Friday at 23:59. A 48-hour grace period is granted for each submission and ends on Sunday at 23:59 with no penalty. Beyond this submission window, extensions will not be possible for any reason. Do not email your assignments to the instructor or TAs.

Weekly quizzes: Every week, a set of practice problems (MCQs, short answers, etc.) related to the lecture materials will be posted in Brightspace. These questions will test your knowledge of the lecture-specific course material. They are untimed and will be accessible for several days. They are untimed and will be accessible for several days. You are allowed—and encouraged—to make multiple attempts within the week. Your highest score will be recorded to keep the assessment low-stakes and aligned with the goal of reinforcing learning through repetition. Weekly quizzes are due on Friday at 23:59. Late attempts will not be allowed. The best 9 scores (out of 11) will be counted.

The **midterm and final exams** will be held in person, on campus. The midterm will be scheduled by the University outside of regular class hours and could occur on a Friday evening, Saturday, or Sunday. The tentative date of the midterm exam is between October 31 and November 2. The final exam will be scheduled during the exam period. Both the midterm and final are closed-book exams. Additional details about each test will be posted on Brightspace at least one week in advance. You are **not required to pass the midterm or final test** to pass the course; however, failure to complete them will result in a score of zero.

Assignments: All assignments will be made available in Brightspace. The best 4 (out of 5) are worth 40% of your final grade. The programming components of assignments will be marked by an **automatic submission server**. You will get instant feedback, and you can submit as often as you want - your best grade is recorded.

For each programming assignment, you'll receive skeleton code and files with very specific names – if you change any of these names or a package your class is in, then the server will not be able to compile your submission. Any improperly packaged submissions or code that fails to compile for any reason will result in a mark of zero.

You are expected to demonstrate good programming practices at all times. Note that your code may be penalized if it is poorly written. Before you start coding, you are also expected to do the necessary preparatory work (i.e., devising an algorithm). You may be asked to present either pseudocode or a flowchart before you receive any assistance from the instructor or a TA.

Grading and Appeal: It is your responsibility to ensure that your marks (assignments, exams, quizzes) published in Brightspace are correct within seven (7) working days of the date the marks were released. Concerns or complaints about the grading must be communicated first to the TA who marked your work, then, if the result is unsatisfactory, to the instructor within that time. After that one week, no further consideration will be offered, and students will not be able to request their marks be changed under any circumstances.

Bonus: The remaining quiz and assignment scores, if completed, will be used as bonus points. This is completely optional; not working for the bonus points will not negatively impact your final grade.

SCS Computer Laboratory: Students taking a COMP course can access the SCS computer labs. The lab schedule and location can be found here. All SCS computer lab and technical support information can be found here. Technical support staff may be contacted in person or virtually; see this page for details.

Additional Notes

In addition to the time spent reading lecture materials and completing assignments and quizzes, students can expect to spend at least nine (9) hours per week on this course. Students are responsible for all course materials, including lecture notes, tutorial exercises, and all materials discussed in class and on any of the official discussion forums.

Students are asked to pose all questions related to course content using the official discussion boards; students should not email the instructor directly unless the question contains confidential information or is of a personal nature.

The instructor will attempt to answer every student's email within three (3) working days from the message received unless the email requests information already posted on Brightspace, the discussion forum, or this course outline. To ensure that all announcements are received, students are expected to check their email daily.

All materials created for this course (including, but not limited to, lecture notes, in-class examples, tutorial exercises, assignments, examinations, and posted solutions) remain the intellectual property of the instructor. These materials are intended for the personal and non-transferable use of students registered in the current offering of the course. Reposting,

reproducing, or redistributing any course materials, in part or whole, without the written consent of the instructor, is strictly prohibited.

Plagiarism Policy:
Any student who violates academic integrity (intentionally or not) must be reported to the Associate Dean (Undergraduate), who will investigate the matter. Penalties for such offences can be found on the ODS webpage.

If you are still unsure of the expectations regarding academic integrity (how to use and cite references, how much collaboration with lab or classmates is appropriate), you are invited to discuss any concerns with the instructor at the earliest opportunity.

Respect in the Classroom and Forums: Please remember to treat your peers and the course staff with respect. Treat the course spaces as professional spaces and behave accordingly. This includes any in-person activity and any course-related forums (Brightspace) and other electronic communications (emails). It is not acceptable to use offensive language or disparage a person or group, no matter the intent. Behavioral misconduct may be reported to Student Affairs. We recommend you read over the 'Class respect and Behaviour' on the Brightspace course page. You are responsible for behaving within these parameters. If you feel you have been disrespected or abused either by other students or course staff, please contact me (email) immediately.

Undergraduate Academic Advisor
The Undergraduate Advisor for the School of Computer Science is available in Room 5302C HP; or by email at scs.ug.advisor@cunet.carleton.ca. The undergraduate advisors can assist with information about prerequisites and preclusions, course substitutions/equivalencies, understanding your academic audit, and the remaining requirements for graduation. The undergraduate advisors will also refer students to appropriate resources such as the Science Student Success Centre, Learning Support Services, and Writing Tutorial Services.

---------- University Policies ----------

For information about Carleton's academic year, including registration and withdrawal dates, see Carleton's Academic Calendar.

Pregnancy Obligation. Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, visit Equity Services.

Religious Obligation. Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, visit Equity Services.

Academic Accommodations for Students with Disabilities If you have a documented disability requiring academic accommodations in this course, please contact the Paul Menton Centre for Students with Disabilities (PMC) at 613-520-6608 or pmc@carleton.ca for a formal evaluation or contact your PMC coordinator to send your instructor your Letter of Accommodation at the beginning of the term. You must also contact the PMC no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if

applicable). After requesting accommodation from PMC, meet with your instructor as soon as possible to ensure accommodation arrangements are made. For more details, visit the Paul Menton Centre website.

Survivors of Sexual Violence. As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and survivors are supported through academic accommodations as per Carleton's Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit: carleton.ca/sexual-violence-support

Accommodation for Student Activities. Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation must be provided to students who compete or perform at the national or international level. Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, see the policy.

Student Academic Integrity Policy. Every student should be familiar with the Carleton University student academic integrity policy. A student found in violation of academic integrity standards may be awarded penalties which range from a reprimand to receiving a grade of *F* in the course or even being expelled from the program or University. Examples of punishable offences include: plagiarism and unauthorized co-operation or collaboration. Information on this policy may be found here.

Plagiarism. As defined by Senate, "plagiarism is presenting, whether intentional or not, the ideas, expression of ideas or work of others as one's own". Such reported offences will be reviewed by the office of the Dean of Science. Standard penalty guidelines can be found here.

Unauthorized Co-operation or Collaboration. Senate policy states that "to ensure fairness and equity in the assessment of term work, students shall not co-operate or collaborate in the completion of an academic assignment, in whole or in part, when the instructor has indicated that the assignment is to be completed on an individual basis". Please refer to the course outline statement or the instructor concerning this issue.